

# The Development of Variable MLM Editor and TSQL Translator Based on Arden Syntax in Taiwan

Yan-Ching Liang and Polun Chang  
Graduate Institute of Health Informatics and Decision Making,  
National Yang-Ming University, Taiwan.

## ABSTRACT

*The Arden Syntax standard has been utilized in the medical informatics community in several countries during the past decade. It is never used in nursing in Taiwan. We try to develop a system that acquire medical expert knowledge in Chinese and translates data and logic slot into TSQL Language. The system implements TSQL translator interpreting database queries referred to in the knowledge modules. The decision-support systems in medicine are data driven system where TSQL triggers as inference engine can be used to facilitate linking to a database.*

## Introduction

The Arden Syntax for Medical Logic System encodes medical knowledge base as Medical Logic Modules (MLMs). An MLM is a hybrid between a production rule and a procedural formalism. It was designed to support clinical decision making. A problem that occurs with any form of clinical knowledge is needed to interact with a clinical database.

To increase the use of decision support system in medicine, it is important to integrate the DSS with clinical database. In order to solve the problem of database and knowledge base integration and acquire medical knowledge in Expert System. We try to develop the system.

## Methods

The system that is used to acquire expert knowledge in Chinese and TSQL translator in order to use Microsoft SQL server 2000 as database and triggers as knowledge base that logic and data slots of MLM are translated by TSQL translator.

It is developed by Microsoft VB.Net to

provide Windows Interface designed for medical experts (Fig1). It included knowledge acquisition of three categories: maintenance, library and knowledge, syntax checker and TSQL translation module. Syntax checker is made according to slot, data type, operators, token and grammar of Arden Syntax. TSQL translator is produced by the result of comparing Arden Syntax with TSQL

## Results

The integrated system provides an easy way to help experts in nursing editing and maintaining subject knowledge. The contexts of triggers which are produced by TSQL translator are utility on Microsoft SQL Server 2000 in an existed database. When data is driven, the trigger as inference engine can execute medical rules.

## Discussion

We have used this system to facilitate the DSS in Nursing in Taiwan. The system has some limits in use. First, An MLM is a ASCII text file, but it must be changed Unicode characters in Chinese. We provide a variable standard of Arden Syntax. Second, Microsoft SQL server is only an extended application database server and triggers must be handmade by DB in database when using the editor system.

## Reference

1. ASTM, Standard specification for defining and sharing modular health knowledge base (Arden Syntax for medical logic modules), 1992 Annual Book of ASTM standards, Vol. 14.01, pp.539-587. American Society for Testing and Materials, Philadelphia (1992).
2. Arkad K, Gao KM. Ahlfeldt H. Query handing in MLM-based decision support systems. Med Inform 1995; 20:229-40.
3. Sailors RM. MLM Writer: An integrated development environment for creating Arden Syntax Medical Logic Modules. Proc AMIA Annu Fall Symp 1996:955.